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Trends and Correlates of Substance Use Disorders among Probationers and Parolees in the United States, 2002–2014

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Abstract

Background—Substance use and crime/recidivism are irrevocably linked. We explore the nuances of this association by highlighting the prevalence, trends, and correlates of substance use dsorders in a large group of probationers/parolees.

Methods—We examined SUDs among probationers and parolees in the United States using data from the National Study on Drug Use and Health (NSDUH). Logistic regression models were computed to examine eight distinct outcomes: alcohol abuse, illicit drug abuse, marijuana/hashish abuse, comorbid alcohol and illicit drug abuse, alcohol dependence, illicit drug dependence, marijuana/hashish dependence, and comorbid alcohol and illicit drug dependence.

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Contributors

NE Fearn led the writing. MG Vaughn conceptualized the study and assisted in the writing and analysis. EJ Nelson conducted the analyses. CP Salas-Wright, M DeLisi, and Z Qian all contributed writing. All authors have read the manuscript and approve of its submission to DAD.

Author Disclosures

None to declare.

Conflict of Interest

None to declare.

Results—Probationers/parolees have high prevalence rates across all SUDs categories and these trends have been relatively constant. Prevalence rates for alcohol abuse and dependence are two to six times higher than for marijuana and other illicit drug abuse and dependence. Key correlates of substance abuse for probationers/parolees include: age, gender, race/ethnicity, education, income, risk propensity, crime/violence measures, and comorbid substance abuse. Similar correlates were found for substance dependence, in addition to employment and mental health treatment.

Conclusions—This study indicates that SUDs are higher among probationer/parolees as compared to their non-supervised counterparts – between four and nine times higher – and these levels have changed little in recent years. Effectively responding to SUDs in this population may enhance adherence to supervision requirements, prevent recidivism, and improve public safety. We may be better served using limited funds for further development of evidence-based policies and programs, such as drug courts, which demonstrate reductions in both drug use and recidivism.

Keywords

Probationers; Parolees; Substance Use Disordersationers; Parolees; Substance Use Disorders

1. INTRODUCTION

At any one time, roughly five million people in the United States are under some form of correctional supervision in the community (Kaeble et al., 2015), and this is not a new trend. Between 2000 and 2014, 4.5 to 5.1 million individuals were on probation or parole, representing about 1 out of every 45 US adult residents. Although substance use/abuse/addiction issues (i.e., substance use disorders, hereafter SUDs) are not the exclusive domain of criminal offenders, they are quite prevalent among individuals who come into contact with the criminal justice system (e.g., Allen and Jacques, 2014; Caudy et al., 2015; Copes et al., 2015; DeLisi et al., 2015; Golder et al., 2014; Hendricks et al., 2014; Rezansoff et al., 2013; Teplin, 1994; Vaughn et al., 2012; Walters, 2015). Consistently, one-quarter of those under supervision are on probation/parole for some type of drug offense and another 14% to 25% received their sanction due to a DUI/DWI or some other public order offense that was often drug-related (Kaeble et al., 2015). In addition to substance-related variables, prior research has also identified gender (male), lower levels of income and education, recent antisocial behavior and impulsivity and risk propensity of offending as correlates of substance use among probationer and parolees (Gendreau et al., 1996; Vaughn et al., 2012). Thus, better understanding and more effectively responding to substance abuse issues among probationers/parolees are key concerns for the criminal justice system and society in general.

SUDs pose and/or exacerbate a variety of physical and mental health problems (see, e.g., Abram et al., 2003; Ruiz et al., 2012; Teplin, 1994; Teplin et al., 1996; Vaughn, 2011), but for individuals under community correctional supervision – who have SUDs – they likely also impact adherence to supervision requirements including treatment mandates, reentry and recidivism, including the ability to maintain non-criminal statuses while being monitored in the community. The criminal justice system and, in particular, its correctional component have become the primary means by which to identify offenders with SUDs and respond to these issues in order to improve outcomes such as successful probation/parole completion and reduced recidivism. To be sure, amid much speculation and anecdotal

evidence, we lack a comprehensive picture of the prevalence, trends, and correlates of SUDs within the community corrections population (e.g., Webster et al., 2010). Such a picture is necessary to inform responsible, timely, and effective policies and programs aimed at increasing public safely and reducing recidivism by eradicating substance abuse and other potentially harmful yet related behaviors by those supervised in our communities.

Although the relationship between drug use and crime is well-established, very little specific information on SUDs – prevalence rates, trends/changes, and correlates – exists for the population under examination in the current study. Absent major changes in correctional programming, it is important to examine the presence of SUDs and ask whether there have been any fluctuations in the prevalence of SUDs among probationers/parolees in the United States. In addition to the need for more detailed information on changes (or stability) in the prevalence of SUDs among community corrections population, rehabilitation, monitoring, and other efforts aimed at increasing successful reentry rates would benefit from more detailed information on the correlates of SUDs. Broader understanding of the behaviors and characteristics associated with SUDs may lead to additional opportunities to more effectively respond to the complex factors that add to the challenge of rehabilitating probationers/parolees in the community. The current study answers these questions and provides an epidemiological examination of SUDs among probationers and parolees in order to more fully explore the extent and nature of this challenging issue among an audience perfectly positioned for treatment.

2. METHODS

2.1. Sample and Procedures

This study examines public-use data collected between 2002 and 2014 as part of the National Study on Drug Use and Health (NSDUH). The NSDUH provides population estimates for an array of substance use and health-related behaviors in the U.S. general population. NSDUH participants include household residents, civilians residing on military bases, and residents of shelters and group homes. Multistage area probability sampling methods are used to select a representative sample of the U.S. civilian, non-institutionalized population aged 12 years or older for participation. Although the NSDUH does not sample participants from correctional facilities, it has been shown to be a useful dataset to study a variety of criminological and criminal justice topics (see Booth et al., 2013; Frank et al., 2014; Salas-Wright et al., 2015; Vaughn et al., 2014, 2015).

NSDUH study participants are interviewed in private at their places of residence using a computer-assisted interviewing (CAI) methodology to increase the likelihood of valid respondent reports (SAMHSA, 2014; Turner et al., 1998). The design and methods are summarized briefly here; however, a detailed description of NSDUH procedures is available elsewhere (see SAHMSA, 2014). Since 2002, a total of 723,283 respondents have completed the NSDUH survey. However, the current study excluded children less than 18 years of age (n = 230,452) and those with missing data (n = 1,374) for SUDs and/or probation or parole status. This resulted in a final sample of 491,457 adult respondents 18 years and older, of which 18,990 (3.9%) were on probation or parole from prison.

2.2. Measures

2.2.1 Probation and parole—Probation and parole were measured based on responses to the following question items: “Were you on probation at any time during the past 12 months?” and “Were you on parole, supervised release, or other conditional release from prison at any time during the past 12 months?” Adults who responded affirmatively to either question were included in the current analysis and are referred to as probationers from here forward.

2.2.2 Substance abuse or dependence—Abuse and dependence criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) were used to determine whether or not respondents had substance abuse or dependence issues. A respondent was categorized as having substance abuse problems if s/he responded positively to one or more of the following four substance abuse criteria: 1) the respondent reported having serious problems due to substance use at home, work, or school; 2) the respondent reported using a substance(s) regularly and then did something where substance use might have put them in physical danger; 3) the respondent reported substance use causing actions that repeatedly got them in trouble with the law; or 4) the respondent reported having problems caused by substance use with family or friends and continued to use the substance even though it was thought to be causing problems with family or friends. A respondent was defined as having substance dependence problems if s/he responded positively to one or more of the following six dependence criteria: 1) the respondent spent a great deal of time over a period of a month getting, using, or getting over the effects of the substance; 2) the respondent was unable to keep set limits on substance use or used more often than intended; 3) the respondent needed to use the substance more than before to get the desired effects or noticed that using the same amount had less effect than before; 4) the respondent was unable to cut down or stop using the substance every time s/he tried or wanted to; 5) the respondent continued to use the substance even though it was causing problems with emotions, nerves, mental health, or physical problems; or 6) the respondent reduced or gave up participation in important activities due to substance use. We included and measured the abuse and dependence of four common substances, namely, alcohol, illicit drugs (including cocaine/crack, methamphetamine, hallucinogens, inhalants, tranquilizers, ecstasy, and/or stimulants), marijuana/hashish, and comorbid alcohol and illicit drug abuse. For each of these substance categories, participants reporting abuse or dependence were coded as 1 and all others coded as 0.

2.2.3 Comorbid substance use—We included measures of past 12-month tobacco use and binge (5+ drinks on the same occasion) drinking. Consuming five or more drinks on the same occasion has been considered to be equivalent to binge drinking as this typically corresponds to a blood alcohol concentration of 0.08 grams percent or above. This measure has been used by the CDC and the National Institute of Alcohol Abuse and Alcoholism for over 10 years and is widely considered as an acceptable measurement of binge consumption (CDC, 2015; NIAAA, 2004). Respondents who reported any instance of tobacco use or binge drinking were coded as 1, with all others coded as 0.

2.2.4 Crime/violence—Indicators of crime and violence were measured based on respondents' reports of involvement in drug selling, theft, attacking a person with the intent to harm them, and driving while intoxicated. Specifically, respondents were asked: "During the past 12 months, how many times have you sold illegal drugs?", "During the past 12 months, how many times of you stolen or tried to steal anything worth more than $50?", and "During the past 12 months, have you driven a vehicle while you were under the influence of alcohol?" in order to assess crime. To assess violence, respondents were asked: "During the past 12 months, how many times have you attacked someone with the intent to seriously hurt them?" For this category, respondents reporting one or more instances of involvement in crime/violence were coded as 1 and those reporting no involvement were coded as 0.

2.2.5 Individual factors—We also included measures of religiosity, risk propensity, and mental health. Religiosity was measured by responses to the following item: "During the past 12 months, how many times did you attend religious services?" Respondents who attended more than 5 times were coded as 1, with all others coded as 0. Risk propensity was based on the following two questions ($\alpha = 0.78$) regarding respondents' enjoyment of risky behavior: "How often do you like to test yourself by doing something a little risky?" and "How often do you get a real kick out of doing things that are a little dangerous?" For each item, individuals who responded sometimes/always were coded as 1 and those who responded never/seldom were coded as 0. This approach is consistent with recent studies examining risk propensity using the NSDUH data (DeLisi et al., 2015; Herman-Stahl et al., 2006). These two risk propensity variables were, in turn, summed and treated as an ordinal (0 = low, 1 = medium, 2 = high) variable in all statistical analyses. We also include an indicator of mental health status, defined as respondents having received any mental health treatment (outpatient or in-patient) during the past 12 months. Respondents who reported any instance of mental health treatment were coded as 1, with all others coded as 0.

2.2.6 Sociodemographic factors—The following sociodemographic variables were defined and included in our analyses: age (categories 18 to 25, 26 to 34, 35 to 49, and ≥50 years), gender (female, male), race/ethnicity (non-Hispanic white, non-Hispanic African American, Hispanic, and other), total annual family income (<$20,000; $20,000 to $49,999; $50,000 to $74,999; and ≥$75,000), employment (yes, no) and education (less than high school, high school graduate or GED, some college, or college graduate). Additionally, respondents were asked about their participation in government assistance programs, including Supplemental Security Income, food stamps, cash assistance, and non-cash assistance. Respondents reporting participation in one or more of these government assistance programs were coded as 1 whereas those who did not were coded as 0.

2.3. Statistical analyses

We used logistic regression to examine associations between substance abuse and dependence and problem drinking, crime/violence, individual factors, sociodemographic measures, and survey year. We fit separate logistic regression models for eight distinct outcomes: alcohol abuse, illicit drug abuse, marijuana/hashish abuse, comorbid alcohol and illicit drug abuse, alcohol dependence, illicit drug dependence, marijuana/hashish dependence, and comorbid alcohol and illicit drug dependence. We included survey year as a

continuous independent variable to assess potential trend changes in SUDs from 2002 to 2014. This approach follows the trend analysis method outlined by the Centers for Disease Control and Prevention (2014) and is consistent with highly-cited trend studies (Ogden et al., 2006) as well as recent trend studies that utilized NSDUH data (Salas-Wright et al., 2015). Prevalence estimates and their corresponding 95% confidence intervals were computed using functions from the "survey" package in R (R Core Team, 2015). Specifically, these functions implement a Taylor series linearization to adjust the standard errors of estimates to account for the complex survey sampling design effects (including clustered multistage data and unequal selection probabilities) that are part of the NSDUH sampling scheme (Lumley, 2015).

3. RESULTS

3.1. The prevalence of SUDs among probationers and parolees

Characteristics of all NSDUH respondents included in the current analyses are presented in Table 1 and differentiated by probation status. Several important differences between probationers and non-probationers are worth mentioning. First, the unadjusted prevalence estimates for alcohol (13.0% vs 3.8%), illicit drug (2.3% vs 0.3%), alcohol and illicit drug (1.1% vs 0.2%), and marijuana/hashish (3.4% vs 0.5%) abuse are significantly higher among probationers compared to non-probationers. A similar pattern for alcohol (14.8% vs. 3.2%), illicit drug (7.6% vs. 0.9%), alcohol and illicit drug (4.1% vs. 0.4%) and marijuana/hashish (5.5% vs. 0.9%) dependence was also observed (see also Figure 1). Probationers were also more likely to report being younger (25.5% vs 15.7% were 18–25 years old), male (72.5% vs 47.6%), non-Hispanic African American (18.7% vs 11.3%), to have lower educational attainment (67.7% vs 45.7% received a high school degree or less), to have lower income (36.5% vs 18.3% had incomes <$20,000), to utilize government assistance programs (34.2% vs 15.9%), and to use tobacco and binge drink as compared to their non-supervised counterparts. Probationers also reported lower levels of religious service attendance, higher levels of risk propensity, and greater instances of selling drugs, attacking someone else with intent to do harm, and driving under the influence of alcohol.

3.2. Trends in SUDs among probationers and parolees

Examining the trends in substance use disorders among adults on probation between 2002 and 2014 also reveals several important findings (see Figure 2). The clearest finding is that the prevalence of substance abuse, irrespective of substance type, is dramatically higher among probationers than non-probationers, and has remained constant across the 12 years of data examined in the current study. It is also worth noting that prevalence estimates for alcohol abuse are approximately six times higher than illicit drug abuse and four times higher than marijuana/hashish abuse. Notably, substance abuse and dependence follow similar patterns from 2002–2014 and remain consistent across the study period.

3.3. Correlates of SUDs among probationers and parolees

Results from the logistic regression analyses are presented in Table 2 for substance abuse and Table 3 for substance dependence. In Table 2 we see that the prevalence of all types of substance abuse is significantly higher for probationers with higher risk propensities and

those who reported driving under the influence of alcohol (ORs ranging from 1.29 to 3.52). On the other hand, younger probationers – as compared to their 50 year and older counterparts – had significantly lower odds of alcohol abuse, marijuana/hashish abuse, and, for 26–34 year olds, comorbid alcohol and illicit drug abuse (ORs ranging from .29 to .68). Males (OR = 1.48, 95% CI = 1.05–2.07) had significantly higher odds of marijuana/hashish abuse compared to females, yet there were no significant differences by gender for the other substance abuse categories. Compared to non-Hispanic whites, Hispanics probationers had higher odds of both alcohol (OR = 1.36, 95% CI = 1.11–1.67) and marijuana/hashish abuse (OR = 1.73, 95% CI = 1.18–2.53). There were no other significant differences by race for any of the other race/ethnicity categories or substance abuse categories.

Respondents reporting higher levels of educational attainment had significantly lower odds of illicit drug abuse (ORs ranging from .42 to .57) as compared to those without a high school diploma or GED. College graduates also had significantly lower odds of marijuana/hashish abuse (OR = .38, 95% CI = .20–.73) and comorbid alcohol and illicit drug abuse (OR = .11, 95% CI = .03–.41) than their probation counterparts without a high school diploma or GED. No significant differences were found for level of educational and alcohol abuse. Interestingly, only one significant relationship was identified across the four levels of household income and the substance abuse categories. Respondents who reported household incomes between $50,000 and $74,999 had lower odds of illicit drug abuse (OR = .48, 95% CI = .26–.89) as compared to those who reported household income levels less than $20,000. . Several of our crime/violence measures were significantly associated with substance abuse in this analysis. More specifically, probationers who reported stealing something worth more than $50 had higher odds of illicit drug abuse (OR = 2.72, 95% CI = 1.61–4.57) and those who reported selling drugs also had significantly higher odds of all kinds of substance abuse, except alcohol (ORs ranging from 1.83 to 4.59). Those who reported attacking another person with intent to harm had increased odds of both illicit drug abuse and comorbid alcohol and drug abuse (ORs = 1.93 and 2.12, respectively).

Examination of both tobacco use and binge drinking also reveals significant associations with the substance abuse categories analyzed here. Probationers reporting tobacco use had higher odds of both alcohol abuse (OR = 1.23, 95% CI = 1.01–1.52) and marijuana/hashish abuse (OR = 1.51, 95% CI = 1.04–2.19). Whereas those who reported binge drinking had higher odds of alcohol abuse, illicit drug abuse, and comorbid alcohol and illicit drug abuse (ORs ranging from 1.40 to 2.40). Importantly, respondents' reports of employment status, participation in government assistant programs, religious service attendance, and mental health treatment were not significantly associated with any of the substance abuse categories under examination. Finally, it should be noted that the inclusion of relevant substance abuse indicators significantly increased the odds of the substance abuse category under consideration. For example, respondents who reported marijuana/hashish abuse had increased odds of illicit drug abuse (OR = 2.10, 95% CI = 1.42–3.12) and those who reported alcohol abuse or illicit drug abuse had higher odds of marijuana/hashish abuse (ORs = 1.76 and 1.78, respectively)

The results from the logistic regression analysis of the four categories of substance dependence are presented in Table 4. Contrary to what we found for substance abuse,

respondents' age is significantly associated with substance dependence with younger probationers exhibiting higher odds for both alcohol and illicit drug dependence (ORs ranging from 1.46 to 1.96). Similar to our results on age and substance abuse, however, younger respondents had lower odds for marijuana/hashish dependence than their older counterparts (ORs ranging from .11 to .55). The association between gender and substance dependence differs slightly as well from our findings regarding substance abuse. Males are at higher odds for alcohol dependence only (OR = 1.25, 95% CI = 1.03–1.52). Whereas Hispanic ethnicity exerted the only statistically significant influence of our race/ethnicity measures on two substance abuse categories, the results of the dependence models indicate that other races – as compared to the non-Hispanic white reference group – have higher odds of alcohol dependence (OR = 1.53, 95% CI = 1.11–2.09). Additionally, non-white African Americans had significantly higher odds of marijuana/hashish dependence (OR = 1.78, 95% CI = 1.40–2.27) than their non-Hispanic white counterparts. Interestingly, both Hispanic and other races had lower odds of illicit drug dependence than non-Hispanic white probationers (ORs = .70 and .64, respectively).

Our findings also indicate that respondents reporting higher educational levels had lower odds of alcohol and illicit drug dependence (ORs ranging from .61 to .82), although no significant associations between education and substance dependence were found for marijuana/hashish or comorbid alcohol and illicit drug dependence. Indicators of household income were also significantly related to our substance dependence categories with lower odds of alcohol, illicit drug, and comorbid alcohol and illicit drug dependence found for respondents in several of the higher income categories (ORs ranging from .51 to .77). Interestingly and contrary to the reported results from the substance abuse models, employment status had a significant association with three of the substance dependence categories – employed respondents had lower odds of illicit drug, marijuana/hashish, and comorbid alcohol and illicit drug dependence (ORs ranging from .57 to .71).

The results for the association between respondents' risk propensities and substance dependence are quite similar to those reported for the substance abuse categories – essentially, probationers with higher risk propensities had significantly higher odds of all kinds of substance dependence with ORs ranging from 1.36 to 2.5. As one might guess, the higher the risk propensity the higher the odds – except for marijuana/hashish dependence, when those with medium risk propensity had greater odds. The crime/violence and the comorbid substance use indicators also have (mostly) intuitively appropriate relations with the four substance dependence categories. Probationers who reported stealing more than $50 worth of goods, those who reported selling drugs – with one important exception -, those who reported attacking someone with the intent to do them harm, those who drove under the influence of alcohol, and those who used tobacco and reported binge drinking all had higher odds of various substance dependence (ORs ranging from 1.36 to 4.74). Notably, probationers who reported selling drugs had lower odds of alcohol dependence than their non-selling counterparts.

Also akin to the results reported for the correlates of our substance abuse categories, neither participation in government assistance programs nor religious service attendance were found to be significantly associated with any of the four substance dependence measures. Contrary

to the substance abuse results presented in Table 2, however, the results here indicate that probationers who reported receiving mental health treatment had significantly higher odds of alcohol, illicit drug, and comorbid alcohol and illicit drug dependence. Finally, analogous to our substance abuse results, respondents who reported marijuana dependence had increased odds of both alcohol and illicit drug dependence and those who reported alcohol dependence and/or illicit drug dependence both had higher odds of marijuana/hashish dependence (ORs ranging from 1.62 to 2.02).

4. DISCUSSION

The current study examined data from a long-standing, national data collection effort to assess the prevalence, trends, and correlates of SUDs among probationers and parolees in the US. Not surprisingly, we found that SUDs – irrespective of substance type and measured as both substance abuse and substance dependence – were much more prevalent among the probationer/parolee population than the general adult population. Importantly, the trend results show that little change has occurred indicating the chronic and robust nature of addiction in this population. For example, our findings are congruent with the detailed analysis of types of drugs used by probationers and parolees in prior research (Vaughn et al., 2012). We also found several important differences between probationers and non-probationers. More specifically, probationers/parolees – as compared to their non-supervised counterparts – were more likely to report: being younger (18–25 years) and much older (50 years and older), male, members of racial/ethnic minority groups, lower educational attainment, less income, greater participation in government assistant programs, lower attendance at religious services, recent mental health treatment, higher risk propensity, stealing, selling drugs, attacking another with intent to harm, driving under the influence of alcohol, using tobacco, and binge drinking. Although many of these differences have been identified in prior studies (Bahr et al., 2010; Gendreau et al., 1996; Vaughn et al., 2012), the present investigation is among the first to document these factors over time.

Clearly, substance abuse and dependence do not occur in a vacuum. Probationers and parolees face numerous challenges and obstacles to adopting/maintaining non-criminal statuses while under correctional supervision in the community (see also Vaughn, 2011). The results of our study suggest that substance abuse and dependency are not new impediments for probationers/parolees. Indeed, our trend results indicate that SUDs, particularly alcohol abuse and dependence, have and continue to pose significant difficulty for individuals on probation/parole – a finding that is bolstered by the results of other recent reports (Bahr et al., 2010; Blasko et al., 2015; Vaughn et al., 2012; Zhang et al, 2013). Rare, however, is the probation/parole contract that does not require abstinence from most, if not all, substances under examination in the current study. Thus, in order to enhance and facilitate the successful return of probationers/parolees to lifestyles free from substance abuse and dependence, we must first recognize, next understand, and finally, appropriately and effectively respond to the real and complex challenges faced by those with SUDs. Not doing so likely continues to contribute to and even potentially exacerbates the ongoing cycle of involvement in the criminal justice (and community corrections) system(s).

The results presented herein indicate that certain key factors are significantly associated with probationer/parolee substance abuse and dependence issues – knowing which factors these are and then effectively and therapeutically responding to these factors, when we can safely do so, is imperative. More specifically, we found increased odds of alcohol *abuse* for Hispanics, those with higher risk propensities, those who reported using tobacco, reported binge drinking, and reported driving under the influence of alcohol. Interestingly, though, we found increased odds of alcohol *dependence* for male probationers/parolees, those under age 50, who reported being "other" races/ethnicities, who reported receiving mental health treatment, high risk propensity, attacking someone with intent to harm, driving under the influence of alcohol, using tobacco, binge drinking, and marijuana dependent. Respondents who had higher levels of education and reported higher household incomes had lower odds of alcohol dependence; none of our measures elicited lowered odds of alcohol *abuse*, however. Other small nuances such as those highlighted above for the alcohol abuse versus alcohol dependence models can be seen with careful substance-specific examination.

Higher odds of illicit drug *abuse* were indicated for probationers/parolees with higher risk propensity, those reporting stealing something worth more than $50, those who sold drugs, attacked someone else with an intent to harm, those who reported driving under the influence of alcohol, reported binge drinking, and those who reported marijuana/hashish abuse. However, lower odds of illicit drug *abuse* were found for probationers/parolees who reported higher education levels and those whose household income was reported between $50,000 and $74,999. Again, small, yet potentially important, differences become apparent with a brief examination of correlates of illicit drug *dependence*. Higher odds for this particular SUD were found for younger respondents, those receiving mental health treatment, those with higher risk propensities, those who reported stealing over $50, selling drugs, attacking someone else with intent to harm them, driving under the influence of alcohol, tobacco use, and marijuana dependence. Lower odds for illicit drug *dependence* were found for Hispanic and other racial/ethnic minorities, college graduates, those whose household incomes were between $20,000 and $49,999, and those who were employed. Again, we see small but perhaps important differences in significant correlates when considering the particular SUD under examination.

Despite recent legislative changes to the legal status of marijuana, we found the following were measures associated with higher odds of marijuana/hashish *abuse*: male respondents, Hispanic ethnicity, high propensity for risk, selling drugs, driving under the influence of alcohol, tobacco use, and self-reported alcohol and illicit drug abuse. Young respondents (compared to those 50 years and older) and those who graduated from college had significantly lower odds of marijuana/hashish *abuse*. Higher odds of marijuana/hashish *dependence* were found for non-Hispanic African-American respondents, those with higher risk propensities, those who reported stealing greater than $50 in goods, selling drugs, attacking someone with harmful intent, driving under the influence of alcohol, using tobacco, and self-reported alcohol and illicit drug dependence. On the other hand, lower odds of marijuana/hashish *dependence* were found for young respondents and those who were employed.

Finally, our analysis also indicates higher odds of comorbid alcohol and illicit drug *abuse* for respondents with high risk propensity, those who reported selling drugs and attacking someone with intent to harm, those who drove under the influence of alcohol, and those who reported binge drinking. Whereas lower odds of this particular SUD were found only for respondents aged 26–34 years (compared with their 50 years and older counterpart) and those who graduated college. Not surprisingly, higher odds for alcohol and illicit drug *dependence* were found for respondents who reported receiving mental health treatment, those with higher risk propensities, those who reported engaging in any of our crime/violence behaviors, and those who used tobacco and reported binge drinking. Moreover, lower odds for alcohol and illicit drug *dependence* were found for respondents who reported household incomes in the top two categories along with those who reported employment.

Substance abuse and substance dependence appear related to a number of potentially and actually harmful behaviors (e.g., crime/violence measures, comorbidity measures) as well as a few potentially insulating/protective factors (e.g., education, employment, income, government assistance programs) as indicated in other recent studies (e.g., Bahr et al., 2010; DeLisi et al., 2015; Ruiz et al., 2012; Salas-Wright et al., 2014; Vaughn, 2011, 2012; Webster et al., 2010). The key to effectively addressing substance abuse/dependence may be as simple (or as difficult and complex) as reducing/eliminating the harmful associations while increasing and enhancing the protective ones. Our results allow us to speculate too that it may, in fact, be more important than previously thought to identify the particular substance use disorder – specifically whether abuse or dependence is the key issue – probationers/parolees are dealing with as small differences in key correlates were found across the eight different SUDs examined.

4.1. Study limitations

A few limitations of the current study warrant mention. First, it must be noted that the data in our analyses and, indeed, our definitions of probationer/parolee and substance abuse/dependency were based on self-reports. As with other studies examining self-report data, a couple of cautions are in order, including: its reliance on respondents' recall/memory and the inherent potential for (un)intentional over-/under-reporting of certain behaviors. Despite the potential weaknesses of self-report crime measures, diverse studies have shown convergence between self-reported and official records of criminal offending on most parameters of the criminal career (Dubow et al., 2014; Farrington et al., 2014; Pollock et al., 2015; Thornberry and Krohn, 2000) with the exception of the total magnitude of offending. Additionally, the computer-based NSDUH interviews are administered in a private setting which has been shown to minimize the under-reporting of behaviors, thus strengthening the results and minimizing bias. Second, although our data are nationally representative, they are not longitudinal but rather a series of cross-sectional collection efforts and, thus, we are unable to draw causal connections between our probationer/parolee designation, substance abuse/dependency variables and the other variables of interest in our study. Despite these limitations, however, the results of the current study provide a solid exploration of the prevalence, trends, and correlates of SUDs – measured as substance abuse and substance dependence, separately – among probationers/parolees in the contemporary United States.

4.2 Conclusions

Despite greater attention to substance use disorders, and increased drug treatment and rehabilitation efforts in recent years, especially proliferation of drug courts (Mitchell et al., 2012; Sevigny et al., 2013; Sullivan et al., 2016), the results of our study indicate that substance abuse and substance dependence remain problematic areas of concern for those under correctional supervision in the community. It is in the interests of public safety, public health, physical and mental wellbeing, and obtaining reduced recidivism that practitioners, researchers, and policymakers become much better informed about the nature and extent of SUDs within this population. Probationers and parolees represent an audience perfectly positioned for a more substantial investment in substance abuse/dependence and mental health treatment options. Indeed, the development, support of, and increased access to additional protective factors (e.g., educational and employment opportunities, government assistance programs, etc.) may pay larger dividends in terms of reduced substance abuse and dependence, recidivism, and criminal justice costs in the end.

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Highlights

- Probationers have higher substance abuse prevalence rates than non-probationers.
- Substance abuse trends among probationers/parolees have been relatively stable.
- Prevalence rates for alcohol abuse/dependence are two to six times higher than for other substances.

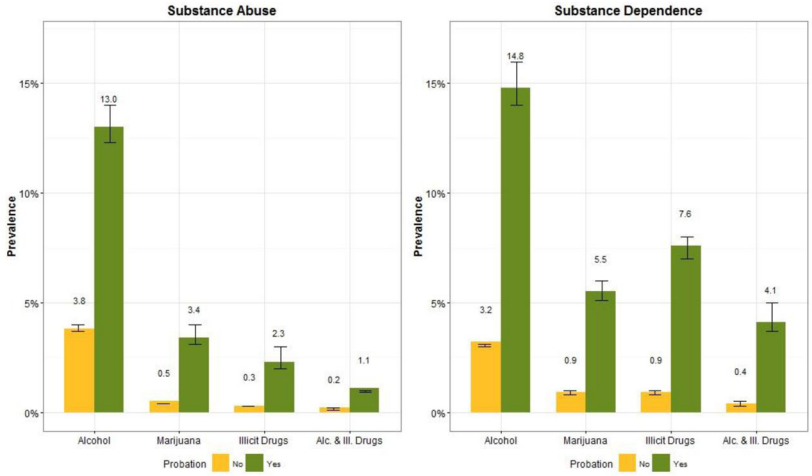

Figure 1.

Prevalence estimates and 95% confidence intervals for prevalence of substance abuse and dependence by probation/parole status, 2002–2014.

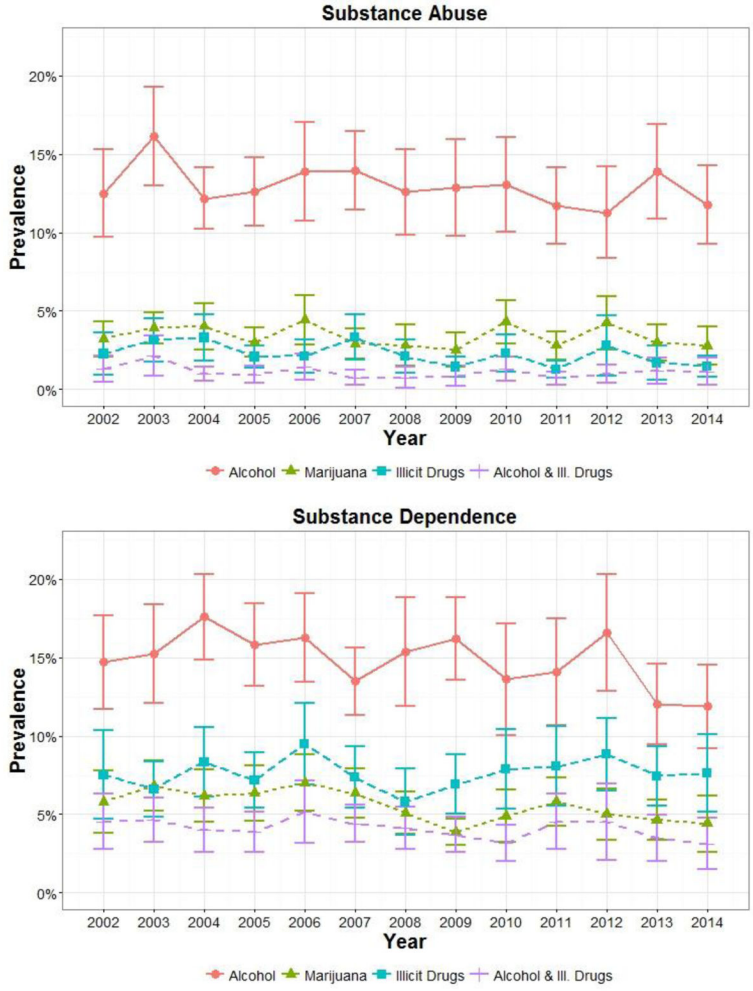

Figure 2.
Substance abuse and dependence among probationers by substance, 2002–2014.

Table 1

Characteristics of adults in the United States by probation status, 2002–2014.

	Probationers (n=18,990)		Non-Probationers (n=472,467)	
	N (%)	95% CI	N (%)	95% CI
SUBSTANCE ABUSE				
Alcohol				
Yes	**2,998 (13.0)**	**(12.2, 13.7)**	**28,446 (3.8)**	**(3.7, 3.9)**
No	16,001 (87.0)	(86.3, 87.8)	444,021 (96.2)	(86.1, 86.3)
Illicit Drug				
Yes	**515 (2.3)**	**(1.9, 2.6)**	**2,624 (0.3)**	**(0.3, 0.4)**
No	18,475 (87.7)	(87.4, 88.1)	469,843 (99.7)	(99.6, 99.7)
Alcohol & Illicit Drug				
Yes	**309 (1.1)**	**(0.9, 1.3)**	**1,744 (0.2)**	**(0.2, 0.2)**
No	18,861 (98.9)	(98.7, 99.1)	470,723 (99.8)	(99.8, 99.8)
Marijuana/Hashish				
Yes	**891 (3.4)**	**(3.0, 3.7)**	**4,444 (0.5)**	**(0.4. 0.5)**
No	18,099 (96.6)	(96.3, 97.0)	468,023 (99.5)	(99.5, 99.6)
SUBSTANCE DEPENDENCE				
Alcohol				
Yes	**2,987 (14.8)**	**(14.0, 15.7)**	**22,100 (3.2)**	**(3.1, 3.3)**
No	16,003 (85.2)	(84.3, 86.0)	450,367 (96.8)	(96.7, 96.9)
Illicit Drug				
Yes	**1,484 (7.6)**	**(7.0, 8.2)**	**6,517 (0.9)**	**(0.8, 0.9)**
No	17,506 (92.4)	(91.8, 93.0)	465,950 (99.1)	(99.1, 99.2)
Alcohol & Illicit Drug				
Yes	**381 (4.1)**	**(3.7, 4.5)**	**3,618 (0.4)**	**(0.4, 0.4)**
No	18,069 (95.9)	(95.5, 96.3)	468,849 (99.6)	(99.6, 99.6)
Marijuana/Hashish				
Yes	**1,561 (5.5)**	**(5.1, 5.9)**	**8,844 (0.9)**	**(0.8, 0.9)**
No	17,429 (94.5)	(94.1, 94.9)	463,623 (99.1)	(99.1, 99.2)
SOCIODEMOGRAPHIC FACTORS				
Age, years				
18–25	**2,874 (25.5)**	**(24.3, 26.7)**	**72,496 (15.7)**	**(15.6, 15.9)**
26–34	2,489 (27.8)	(26.6, 28.9)	103,415 (28.2)	(28.0, 28.4)
35–49	**600 (12.8)**	**(11.7, 13.9)**	**75,299 (41.8)**	**(41.5, 42.1)**
50+	**13,027 (34.0)**	**(32.9, 35.1)**	**221,257 (14.3)**	**(14.1, 14.4)**
Gender				
Male	**13,351 (72.5)**	**(71.4, 73.5)**	**215,654 (47.6)**	**(47.3, 47.8)**
Female	5,639 (27.5)	(26.5, 28.6)	256,813 (52.4)	(52.2, 52.7)
Race/Ethnicity				
NH White	**10,543 (56.9)**	**(55.6, 58.2)**	**307,448 (68.8)**	**(68.4, 69.1)**
NH African American	**3,217 (18.7)**	**(17.7, 19.7)**	**56,503 (11.3)**	**(11.0, 11.5)**

	Probationers (n=18,990)		Non-Probationers (n=472,467)	
	N (%)	95% CI	N (%)	95% CI
Hispanic	**1,660 (4.7)**	**(4.7, 5.3)**	**38,490 (6.5)**	**(6.4, 6.7)**
Other	**3,570 (19.7)**	**(18.7, 20.6)**	**70,026 (13.4)**	**(13.2, 13.6)**
Educational Attainment				
<High School	**6,571 (31.3)**	**(30.1, 32.5)**	**76,010 (15.1)**	**(14.9, 15.3)**
High School/GED	**7,202 (36.4)**	**(35.3, 37.5)**	**153,752 (30.6)**	**(30.3, 30.9)**
Some College	**4,302 (24.6)**	**(23.7, 25.5)**	**137,768 (25.8)**	**(25.6, 26.0)**
College Graduate	**915 (7.7)**	**(6.9, 8.6)**	**104,937 (28.5)**	**(28.2, 28.8)**
Household Income				
<$20,000	**7,263 (36.5)**	**(35.2, 37.8)**	**118,006 (18.3)**	**(18.1, 18.6)**
$20,000–$49,999	**7,272 (39.1)**	**(37.8, 40.4)**	**166,924 (33.8)**	**(33.5, 34.0)**
$50,000–$74,999	**2,091 (11.4)**	**(10.7, 12.2)**	**77,178 (17.7)**	**(17.5, 17.9)**
>$75,000	**2,364 (13.0)**	**(12.1, 13.9)**	**110,359 (30.2)**	**(29.9, 30.6)**
Employment Status				
Yes	12,286 (65.4)	(64.1, 66.6)	331,859 (66.5)	(66.2, 66.7)
No	6,692 (34.6)	(33.4, 35.9)	140,424 (33.5)	(33.3, 33.8)
Government Assistance Programs				
Yes	**6,616 (34.2)**	**(33.1, 35.4)**	**91,368 (15.9)**	**(15.7, 16.1)**
No	12,374 (65.8)	(64.6, 66.9)	381,099 (84.1)	(83.9, 84.3)
INDIVIDUAL FACTORS				
Religious Service Attendance				
Yes	**4,768 (27.3)**	**(26.2, 28.5)**	**182,340 (43.4)**	**(43.1, 43.7)**
No	14,102 (72.7)	(71.5, 73.8)	287,610 (56.6)	(56.3, 56.9)
Mental Health Treatment				
Yes	**3,693 (21.9)**	**(20.8, 22.9)**	**62,691 (13.4)**	**(13.2, 13.6)**
No	15,203 (88.1)	(87.1, 89.2)	408,404 (86.6)	(86.4, 86.8)
Risk Propensity				
Low	**9,823 (58.1)**	**(57.0, 59.2)**	**339,132 (80.0)**	**(79.8, 80.2)**
Medium	**3,386 (16.5)**	**(15.6, 17.3)**	**57,969 (9.4)**	**(9.3, 9.5)**
High	**5,734 (25.5)**	**(24.5, 26.4)**	**73,383 (10.6)**	**(10.5, 10.7)**
CRIME/VIOLENCE				
Stole >$50				
Yes	**1,725 (6.8)**	**(6.3, 7.4)**	**7,032 (0.8)**	**(0.8, 0.9)**
No	17,166 (93.2)	(92.6, 93.7)	464,689 (99.2)	(99.1, 99.2)
Sold Drugs				
Yes	**1,900 (9.8)**	**(9.1, 10.5)**	**1,997 (0.8)**	**(0.8, 0.9)**
No	12,927 (91.2)	(89.5, 90.9)	466,501 (99.2)	(99.1, 99.2)
Attack with Intent to Harm				
Yes	**2,229 (8.2)**	**(7.6, 8.7)**	**11,775 (1.2)**	**(1.2, 1.2)**
No	16,677 (91.8)	(91.3, 92.4)	460,055 (98.8)	(98.8, 98.8)
Driving Under the Influence of Alcohol				
Yes	**5,291 (24.3)**	**(23.2, 25.3)**	**78,726 (12.7)**	**(12.5, 12.8)**

	Probationers (n=18,990)		**Non-Probationers (n=472,467)**	
	N (%)	**95% CI**	**N (%)**	**95% CI**
No	13,631 (75.7)	(74.7, 76.8)	392,335 (87.3)	(87.2, 87.5)
COMORBID SUBSTANCE USE				
Tobacco Use				
Yes	**13,523 (66.6)**	**(65.4, 67.9)**	**172,117 (28.2)**	**(28.0, 28.4)**
No	5,467 (33.4)	(32.1, 34.6)	300,350 (71.8)	(71.6, 72.0)
Binge Drinking				
Yes	**9,594 (44.4)**	**(43.2, 45.7)**	**151,135 (24.1)**	**(23.9, 24.3)**
No	9,396 (55.6)	(54.3, 56.8)	321,332 (75.9)	(75.7, 72.1)

CI = Confidence Interval; NH = Non-Hispanic; GED = graduate equivalence diploma

Percentages and 95% confidence intervals are adjusted for the survey sampling design and may not reflect the percentages of the values in the table. Estimates and 95% CIs in bold are statistically significant ($p < .05$).

Table 2

Associations with substance abuse among adults on probation in the United States, 2002–2014.

	Alcohol Abuse		Illicit Drug Abuse		Marijuana/Hashish Abuse		Alcohol and Illicit Drug Abuse	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Age, years								
18–25	**0.68**	**(0.56, 0.82)**	0.92	(0.57, 1.46)	**0.54**	**(0.37, 0.78)**	0.67	(0.36, 1.26)
26–34	**0.63**	**(0.50, 0.80)**	0.80	(0.50, 1.27)	**0.30**	**(0.19, 0.47)**	**0.29**	**(0.13, 0.63)**
35–49	**0.54**	**(0.35, 0.83)**	1.00	(0.42, 2.37)	**0.46**	**(0.21, 0.98)**	0.59	(0.15, 2.28)
50+	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Gender								
Male	1.06	(0.87, 1.28)	1.47	(0.98, 2.20)	**1.48**	**(1.05, 2.07)**	1.34	(0.72, 2.47)
Female	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Race/Ethnicity								
NH White	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
NH African American	0.92	(0.73, 1.17)	0.64	(0.28, 1.46)	1.40	(0.97, 2.01)	0.90	(0.48, 1.68)
Hispanic	**1.36**	**(1.11, 1.67)**	1.00	(0.65, 1.53)	**1.73**	**(1.18, 2.53)**	1.40	(0.79, 2.49)
Other	0.99	(0.74, 1.32)	1.41	(0.66, 3.01)	1.19	(0.72, 1.97)	0.45	(0.16, 1.23)
Education								
< High School	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
High School Graduate/GED	0.90	(0.74, 1.10)	**0.57**	**(0.39, 0.82)**	0.83	(0.62, 1.12)	0.67	(0.42, 1.06)
Some College	1.00	(0.79, 1.26)	**0.56**	**(0.35, 0.88)**	0.81	(0.56, 1.18)	0.80	(0.48, 1.34)
College Graduate	1.17	(0.79, 1.71)	**0.42**	**(0.18, 0.98)**	**0.38**	**(0.20, 0.73)**	**0.11**	**(0.03, 0.41)**
Household Income								
<$20,000	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
$20,000–$49,999	1.11	(0.90, 1.37)	0.81	(0.53, 1.26)	0.87	(0.65, 1.16)	1.25	(0.76, 2.06)
$50,000–$74,999	1.11	(0.87, 1.42)	**0.48**	**(0.26, 0.89)**	0.75	(0.48, 1.17)	1.24	(0.55, 2.79)
>$75,000	1.05	(0.82, 1.33)	0.63	(0.40, 1.02)	1.29	(0.83, 2.00)	1.43	(0.71, 2.87)
Employed								
Yes	0.97	(0.81, 1.17)	1.22	(0.80, 1.84)	0.94	(0.74, 1.20)	0.92	(0.58, 1.46)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Government Assistance Programs								

	Alcohol Abuse		Illicit Drug Abuse		Marijuana/Hashish Abuse		Alcohol and Illicit Drug Abuse	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Yes	0.89	(0.76, 1.05)	1.11	(0.74, 1.67)	1.13	(0.82, 1.56)	1.21	(0.75, 1.95)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Religious Service Attendance								
Yes	0.88	(0.72, 1.07)	0.97	(0.70, 1.34)	1.02	(0.74, 1.39)	0.83	(0.49, 1.41)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Mental Health Treatment								
Yes	1.10	(0.89, 1.36)	1.36	(0.92, 2.00)	1.12	(0.80, 1.56)	0.63	(0.38, 1.04)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Risk Propensity								
Low	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Medium	**1.29**	**(1.05, 1.59)**	1.48	(0.93, 2.34)	1.45	(0.97, 2.17)	0.93	(0.50, 1.75)
High	**1.31**	**(1.09, 1.57)**	**1.88**	**(1.28, 2.77)**	**1.68**	**(1.22, 2.30)**	**1.63**	**(1.02, 2.61)**
Stole >$50								
Yes	1.00	(0.73, 1.38)	**2.72**	**(1.61, 4.57)**	1.02	(0.68, 1.54)	1.09	(0.68, 1.73)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Sold Drugs								
Yes	1.09	(0.87, 1.36)	**1.83**	**(1.12, 2.99)**	**4.59**	**(3.47, 6.07)**	**2.71**	**(1.69, 4.35)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Attack with Intent to Harm								
Yes	1.06	(0.84, 1.33)	**1.93**	**(1.28, 2.93)**	0.88	(0.60, 1.27)	**2.12**	**(1.35, 3.35)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Driving Under the Influence of Alcohol								
Yes	**3.52**	**(2.97, 4.16)**	**1.74**	**(1.21, 2.52)**	**1.31**	**(1.01, 1.71)**	**3.17**	**(2.20, 4.58)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Tobacco Use								
Yes	**1.23**	**(1.01, 1.52)**	0.94	(0.59, 1.51)	**1.51**	**(1.04, 2.19)**	1.34	(0.76, 2.38)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Binge Drinking								
Yes	**2.40**	**(1.99, 2.89)**	**1.40**	**(1.01, 1.96)**	1.13	(0.81, 1.58)	**1.71**	**(1.03, 2.85)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*

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	Alcohol Abuse		Illicit Drug Abuse		Marijuana/Hashish Abuse		Alcohol and Illicit Drug Abuse	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Marijuana Abuse								
Yes	0.95	(0.74, 1.21)	**2.10**	**(1.42, 3.12)**	-	-	-	-
No	1.0	*(referent)*	1.0	*(referent)*	-	-	-	-
Alcohol Abuse								
Yes	-	-	-	-	**1.76**	**(1.30, 2.36)**	-	-
No	-	-	-	-	1.0	*(referent)*	-	-
Illicit Drug Abuse								
Yes	-	-	-	-	**1.78**	**(1.26, 2.53)**	-	-
No	-	-	-	-	1.0	*(referent)*	-	-
Survey Year	1.01	(0.99, 1.03)	0.98	(0.93, 1.03)	0.99	(0.96, 1.03)	1.00	(0.94, 1.06)

OR = odds ratio; 95% CI = 95% Confidence Interval; NH=Non-Hispanic; GED = graduate equivalence diploma

Note: Odds ratios (OR) for substance abuse measures are mutually adjusted for age, gender, race/ethnicity, educational attainment, household income, employment status, participation in government assistance programs, religious service attendance, mental health treatment, risk propensity, stealing >$50, selling drugs, attacking a person with the intent to harm them, tobacco use, binge drinking, driving a motor vehicle under the influence of alcohol, and survey year. Where indicated, select models are also adjusted for marijuana/hashish, alcohol, or illicit drug abuse. ORs and 95% CIs in bold are statistically significant ($p < .05$).

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Table 3

Associations with substance dependence among adults on probation in the United States, 2002–2014.

	Alcohol Dependence		Illicit Drug Dependence		Marijuana/Hashish Dependence		Alcohol and Illicit Drug Dependence	
	OR	**95%CI**	**OR**	**95%CI**	**OR**	**95%CI**	**OR**	**95%CI**
Age, years								
18–25	**1.65**	**(1.38, 1.99)**	**1.96**	**(1.57, 2.44)**	**0.55**	**(0.44, 0.70)**	1.43	(1.06, 1.94)
26–34	**1.46**	**(1.19, 1.79)**	**1.92**	**(1.44, 2.55)**	**0.30**	**(0.20, 0.45)**	1.16	(0.79, 1.71)
35–49	**1.63**	**(1.03, 2.58)**	1.16	(0.63, 2.12)	**0.11**	**(0.05, 0.27)**	0.69	(0.32, 1.51)
50+	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Gender								
Male	**1.25**	**(1.03, 1.52)**	0.79	(0.62, 1.01)	1.09	(0.84, 1.40)	1.19	(0.86, 1.66)
Female	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Race/Ethnicity								
NH White	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
NH African American	0.98	(0.78, 1.24)	0.84	(0.61, 1.16)	**1.78**	**(1.40, 2.27)**	1.71	(1.16, 2.51)
Hispanic	1.16	(0.91, 1.48)	**0.70**	**(0.50, 0.97)**	1.17	(0.91, 1.50)	1.27	(0.83, 1.97)
Other	**1.53**	**(1.11, 2.09)**	**0.64**	**(0.41, 0.99)**	0.94	(0.65, 1.36)	0.89	(0.54, 1.44)
Education								
< High School	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
High School Graduate/GED	**0.82**	**(0.67, 0.99)**	1.01	(0.77, 1.34)	0.81	(0.62, 1.06)	0.79	(0.57, 1.08)
Some College	0.85	(0.66, 1.10)	0.94	(0.69, 1.27)	0.99	(0.76, 1.29)	0.79	(0.54, 1.16)
College Graduate	**0.62**	**(0.41, 0.93)**	**0.61**	**(0.38, 0.97)**	0.67	(0.36, 1.25)	0.66	(0.37, 1.20)
Household Income								
<$20,000	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
$20,000–$49,999	**0.71**	**(0.60, 0.86)**	**0.77**	**(0.62, 0.95)**	1.21	(0.92, 1.59)	0.77	(0.54, 1.09)
$50,000–$74,999	**0.61**	**(0.47, 0.79)**	0.87	(0.65, 1.15)	0.81	(0.58, 1.13)	**0.51**	**(0.33, 0.78)**
>$75,000	0.82	(0.59, 1.13)	1.02	(0.74, 1.41)	0.87	(0.62, 1.22)	**0.63**	**(0.41, 0.97)**
Employed								
Yes	0.86	(0.71, 1.04)	**0.62**	**(0.49, 0.79)**	**0.71**	**(0.58, 0.87)**	**0.57**	**(0.43, 0.75)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Government Assistance Programs								

	Alcohol Dependence		Illicit Drug Dependence		Marijuana/Hashish Dependence		Alcohol and Illicit Drug Dependence	
	OR	**95%CI**	**OR**	**95%CI**	**OR**	**95%CI**	**OR**	**95%CI**
Yes	0.93	(0.78, 1.11)	1.08	(0.86, 1.35)	1.16	(0.90, 1.49)	0.81	(0.58, 1.13)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Religious Service Attendance								
Yes	1.04	(0.85, 1.26)	0.96	(0.77, 1.19)	0.92	(0.74, 1.16)	1.25	(0.89, 1.76)
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Mental Health Treatment								
Yes	**2.00**	**(1.61, 2.48)**	**2.32**	**(1.90, 2.83)**	1.21	(0.95, 1.55)	**2.37**	**(1.80, 3.14)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Risk Propensity								
Low	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Medium	1.21	(0.94, 1.56)	**1.47**	**(1.11, 1.96)**	**1.60**	**(1.24, 2.06)**	**2.14**	**(1.48, 3.09)**
High	**1.42**	**(1.18, 1.72)**	**2.10**	**(1.63, 2.71)**	**1.36**	**(1.06, 1.74)**	**2.50**	**(1.80, 3.47)**
Stole >$50								
Yes	1.11	(0.87, 1.42)	**4.74**	**(3.43, 6.54)**	**1.36**	**(1.07, 1.73)**	**2.18**	**(1.59, 2.99)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Sold Drugs								
Yes	**0.69**	**(0.52, 0.91)**	**2.27**	**(1.74, 2.97)**	**2.37**	**(1.82, 3.10)**	**1.77**	**(1.29, 2.42)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Attack with Intent to Harm								
Yes	**1.57**	**(1.28, 1.93)**	**1.42**	**(1.05, 1.91)**	**1.43**	**(1.09, 1.87)**	**1.82**	**(1.29, 2.55)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Driving Under the Influence of Alcohol								
Yes	**3.73**	**(3.09, 4.49)**	**1.73**	**(1.39, 2.16)**	**1.43**	**(1.04, 1.96)**	**3.75**	**(2.71, 5.20)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Tobacco Use								
Yes	**1.61**	**(1.29, 2.00)**	**2.99**	**(2.13, 4.20)**	**1.99**	**(1.50, 2.64)**	**2.57**	**(1.74, 3.79)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*
Binge Drinking								
Yes	**3.25**	**(2.61, 4.05)**	0.99	(0.78, 1.25)	1.06	(0.84, 1.33)	**2.32**	**(1.63, 3.31)**
No	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*	1.0	*(referent)*

	Alcohol Dependence		Illicit Drug Dependence		Marijuana/Hashish Dependence		Alcohol and Illicit Drug Dependence	
	OR	**95%CI**	**OR**	**95%CI**	**OR**	**95%CI**	**OR**	**95%CI**
Marijuana Dependence								
Yes	**2.01**	**(1.54, 2.62)**	**1.92**	**(1.49, 2.47)**	-	-	-	-
No	1.0	*(referent)*	1.0	*(referent)*	-	-	-	-
Alcohol Dependence								
Yes	-	-	-	-	**1.62**	**(1.28, 2.05)**	-	-
No	-	-	-	-	1.0	*(referent)*	-	-
Illicit Drug Dependence								
Yes	-	-	-	-	**2.02**	**(1.59, 2.55)**	-	-
No	-	-	-	-	1.0	*(referent)*	-	-
Survey Year	0.98	(0.96, 1.01)	1.00	(0.97, 1.03)	**0.97**	**(0.95, 0.99)**	0.99	(0.95, 1.02)

OR = odds ratio; 95% CI = 95% Confidence Interval; NH=Non-Hispanic; GED = graduate equivalence diploma

Note: Odds ratios (OR) for substance abuse measures are mutually adjusted for age, gender, race/ethnicity, educational attainment, household income, employment status, participation in government assistance programs, religious service attendance, mental health treatment, risk propensity, stealing >$50, selling drugs, attacking a person with the intent to harm them, tobacco use, binge drinking, driving a motor vehicle under the influence of alcohol, and survey year. Where indicated, select models are also adjusted for marijuana/hashish, alcohol, or illicit drug dependence. ORs and 95% CIs in bold are statistically significant ($p < .05$).

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